Amendment of the Part 90 Rules in the 902-928 MHz Band (LMS)

WT Docket No. 06-49

The Part 15 Coalition,
The Consumer Electronics Association
and
The Telecommunications Industry Association

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The American Petroleum Institute

The American Petroleum Institute ("API") is a national trade association representing approximately 400 companies involved in all phases of the petroleum and natural gas industries, including the exploration, production, refining, marketing and transportation of petroleum, petroleum products and natural gas.

API member companies make extensive use of license-exempt spectrum in the 902-928 MHz band for myriad functions performed by Supervisory Control and Data Acquisition ("SCADA") systems in connection with the production, collection and pipeline transportation of petroleum and natural gas. Such SCADA systems ensure effective oil and natural gas industry operations and are critical to safety of life and the protection of property and the environment.

SCADA systems that employ this spectrum are used to remotely operate large production fields, sometimes comprised of thousands of oil and/or natural gas wells. These systems collect and transmit to a central automation center critical data regarding well pressures, temperature, and rates of flow that are essential to the coordinated and safe operation of a production facility. SCADA systems are used to transmit alarms in the event of a leak.

Similar SCADA systems are employed in systems used to gather crude oil and natural gas. In applications similar to those used in production scenarios, this spectrum is used to support systems that measure pipeline pressure and flow rates, detect leaks, and open and close valves. Such functions are critical to safe and efficient gathering operations and to the public health, particularly in the event of a leak.

SCADA systems that utilize frequencies from this band are also used for petroleum and natural gas transmission pipeline operation, enabling operators to measure flow rate, temperature and pressure. As in gathering systems, these SCADA systems are not only used to detect leaks, but also to open and close valves.

Implementation of any rule change which could increase interference to such systems would have a devastating impact on the operations of these SCADA systems and a significant deleterious effect on the ability of API's members to ensure the safe and effective production, collection and pipeline transportation of oil and natural gas resources.

Association of American Railroads

The Association of American Railroads ("AAR") is a voluntary non-profit membership organization whose Class I freight railroad members generate over 90% of the total operating revenues of all freight railroads in the U.S. AAR's other members include Amtrak, the nation's principal intercity passenger railroad, and numerous regional and short line railroads. AAR serves as the FCC-certified frequency advisory committee performing frequency coordination in the Private Land Mobile Radio (PLMR) bands for frequencies designated in Section 90.35 of the Commission's rules for exclusive frequency coordination by the railroad industry. The railroad industry relies very heavily on wireless communications – both licensed and unlicensed – for the day-to-day operation of the nation's rail network.

Unlicensed communications devices, including those that operate in the multilateration LMS bands that are the subject of this proceeding, play an increasingly important and integral role in the railroad business. Most of these unlicensed devices are used in rail yards, depots, terminals and hub centers to enhance productivity and efficiency in a variety of processes and applications. For example, unlicensed devices are used for the wireless downloading of onboard event-recorder logs on locomotives. In addition, unlicensed systems are extremely important for the tracking and management of intermodal traffic (ship cargo containers or truck trailers that are transported by railroad flatbed car), which is an increasingly large component of overall freight rail traffic. Other examples include systems deployed in railroad mechanical shops that enable workers to report their time on wireless kiosks located throughout the shop area, and to check out tools using wireless scanners located at tool checkout counters. There are many other types of unlicensed wireless LAN applications in use throughout the railroad industry to support back-office and other business operations, not to mention many cordless telephones and cordless headsets used in office areas. In total, there are thousands upon thousands of unlicensed devices deployed throughout the rail industry that have enabled America's railroads to operate more efficiently and productively. AAR is pleased to join the other parties in the Part 15 Coalition in urging the Commission to take no action that would jeopardize the effectiveness of these devices.

Boston Scientific Corporation

Boston Scientific is a worldwide developer, manufacturer and marketer of medical devices whose products are used in a broad range of interventional medical specialties.

Boston Scientific's Cardiac Rhythm Management (CRM) Group (formerly Guidant) is a leading developer of implantable cardiac devices used to treat arrhythmias, sudden cardiac arrest and heart failure. Boston Scientific CRM's recent product offerings are enabled with Ultra High Frequency (UHF) Radio Frequency (RF) telemetry. These products including the LATITUDE Communicator, an in home monitoring device for remote follow up of cardiac device patients. The LATITUDE Communicator periodically interrogates the implantable device for information as specified by the patient's physician and then transmits the data to a secure Internet server where care providers can then review this medical information.

Because its medical devices use the ISM band, Boston Scientific is interested in any possible changes to the band.

Intelleflex

Intelleflex Corporation provides long range semi-passive RFID solutions for a variety of asset and product tracking applications. Intelleflex's RFID products are built on the EPC Global passive RFID standard but have extended capabilities using battery assisted communication and high sensitivity receivers to read asset tags up to 100 meters. We are participating in the efforts in both EPC Global and the International Standards Organization to standardize semi-passive RFID communication protocol. Our tags also incorporate large memory capacity and support a variety of sensors to provide timely monitoring of critical measurements.

The worldwide standard for very low cost passive RFID is at 902-928 MHz:

- Long range (~100 m) capability of battery assisted passive RFID requires high sensitivity readers (-100 dBm)
- Wide range of applications enabled by battery assisted passive RFID tags, sensors, memory
- Large portion of these applications requires outdoor tracking of containers and assets
- Reliability is compromised by high level interferers

Wide Range of Applications Enabled by Battery Assisted RFID

- WIP and Parts Management in Manufacturing
- Asset Management
- Yard Management
- Nested Supply Chain Management
- Security and Access Control
- Condition Monitoring (future)

Motorola

Motorola products that utilize the 902-928 MHz band include wireless broadband Canopy radios, RFID solutions, land mobile MOTOtalk™ (Direct Talk℠) and DTR Series™ radios[1]. These are described below.

- The Canopy system provides high quality broadband service in the 902-928 MHz bands via a 6.0 Mbps signaling rate with a line-of-sight range of more than 40 miles and is particularly suited to delivery of broadband services in rural areas.[2] As of May 30, 2006, more than 70,000 Canopy 900 MHz modules have been deployed. The Canopy 900 MHz system is used in the following applications:
  - Education – As an example, one school district in North Carolina deployed Canopy 900 MHz modules to enable more than 1,200 students to have broadband access for research and distance learning.
  - Residential Broadband Access – In low population density areas, Canopy 900 MHz modules provide cost effective broadband access in areas where DSL or other wire based alternatives cannot be cost justified. Canopy 900 MHz modules are part of the USDA Rural Utility Services (RUS) program.
  - Non Line of Sight Applications – In geographic areas where higher frequency wireless broadband cannot be deployed due to foliage obstructions, Canopy 900 MHz modules provide non-line of sight coverage up to 4 miles without requiring changes to the landscape.
- MOTOtalk™ (also call Direct Talk℠ in the Sprint-Nextel service brand) is a push-to-talk feature implemented in our iDEN radios which creates a temporary virtual network with other MOTOtalk™ capable units with-in 2 miles, this service keeps users connected if the regular network is down, the signal is weak or the users are in out-of-coverage areas. It allows them to transfer manually to a simplex two-way radio-to-radio communication mode and is also useful for private or group communications for non-mission critical government use, construction teams, utilities, outdoor sports enthusiasts or groups that travel outside of Nextel coverage. As of May 1, 2006 MOTOtalk™ is in the following iDEN handsets approved by the FCC: i315, i325, i580, i740, and i870.[3]

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1 *See* http://www.motorola.com/dtr

2 *See* http://www.motorola.com/canopy.

3 *See* http://nextelonline.nextel.com/assets/pdfs/en/about/directtalk_fact_sheet.pdf

- DTR Series™ provides similar capabilities to MOTOtalk™ for on-site communications in hospitality, retail and manufacturing environments but on a stand-alone, non-integrated device. A typical deployment in an on-site application encompass anywhere from 5-10 devices to hundreds of devices.
- Motorola RFID include mobility solutions that incorporate wireless networking, RFID, bar code scanning, imaging and more to streamline business processes and maximize the value of business data.[4] Motorola's RFID solution is deployed with some of the world's leading companies and include some of the largest RFID implementations; our products include many firsts — including the first commercially available EPC RFID handheld reader, EPC RFID portal system, and mobile RFID reader. Motorola's RFID portfolio includes:
    - A full line of RFID readers, including fixed, handheld and mobile.
    - Motorola and our network of certified tag partners offer a full line of tagging solutions for all industries and diverse application needs.
    - A full range of antennas to maximize the performance of Motorola RFID fixed readers and provide for a wide range of environmental requirements — from space-constrained mounting locations to indoor or outdoor environmental conditions or high-capacity applications.

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4 *See* http://www.symbol.com/products/rfid-readers.

Utilities Telecom Council - Representing Critical Infrastructure Communications

The Utilities Telecom Council (UTC) is the only trade association devoted entirely to the telecommunications and information technology interests of critical infrastructure (CI) entities. Through its core members and affiliated trade associations, UTC represents virtually every electric, gas, and water utility and energy pipeline in the country – both public and investor- owned -- on issues affecting their communications networks and infrastructure. UTC also welcomes an associate membership that includes a wide variety of the nation's largest equipment manufacturers, engineering companies and others that support the communications needs of its core members. These diverse members have united to ensure the integrity of the critical infrastructure communications networks that support the safe, reliable and secure delivery of essential services to the public at large.

Since 1948, UTC's primary focus has been protecting and promoting the private internal communications of the nation's critical infrastructures. These communications networks are designed, built and operated to the highest standards – which must exceed those available on consumer-oriented commercial service networks. They are used for routine dispatch, emergency restoration and for remote monitoring and control of valves, switches and systems, among other functions. As such, these networks are essential to protect the safety of life, health and property and cannot be compromised.

To help its members ensure the reliability of the basic services they provide, UTC seeks to protect their rights as licensees of radio-frequency spectrum and to gain CI access to new spectrum as needed. The Council also tries to protect members' rights over their own infrastructure to ensure its safety, to enable their opportunities to use and provide telecommunications services as desired, and to assist members with their move to more advanced technology and compliance with homeland security responsibilities. In these efforts, UTC works with the Federal Communications Commission, Congress, the Departments of Commerce and Homeland Security and other agencies and offices – including state governments -- as needed.

UTC also represents the interests of members that act as facilitators and providers of telecommunications services to the public. As facilitators, UTC's members provide capacity services on the fiber networks and the poles, ducts, conduit and rights-of-way that they own or control; others are engaged in municipal networks. As providers of telecommunications services to the public, in many cases UTC's members offer the only alternative to incumbent telecommunications and cable companies. UTC supports a pro-competitive,

deregulatory national policy framework by advocating telecommunications competition among all providers.

In its nearly sixty-year history, UTC has grown into a global federation of industry and affiliated trade association members representing more than 10,000 organizations serving virtually every community in America. UTC represents all types of companies, from large combined utilities serving millions of customers to small, rural electric cooperatives and water districts that service only a few hundred customers each. Affiliated associations operate in Canada (UTC Canada), Europe (UTC Europe) and South America (Aptel). In addition, the nation's major critical infrastructure trade associations are affiliated members of UTC. Together with UTC they formed the Critical Infrastructure Communications Coalition (CICC) to discuss and advocate on telecommunications and information technology issues affecting all critical infrastructure organizations.

WISPA

WISPA is a wireless ISP association that has more than 100 active (paying) ISP members nationwide and more than 800 users on its list serve, most of which are WISP owners/operators. WISPA members make extensive use of the 902-928 MHz band, including in rural areas.

WISPA has conducted its own study of 900 MHz use – in a rural area – which indicates heavy use of the band by Part 15 users.

The ZigBee Alliance

The ZigBee Alliance is a not-for-profit industry organization with over 200 member companies, from Fortune 100 to pioneering startups. Dozens of products are on the market today – the primary focuses are residential, commercial and light industrial automation, energy management, environmental monitoring and control, and security/safety monitoring.

ZigBee IEEE 802.15.4

- Short-range (50-150m) digital packet radio transceivers, designed for sensor and control devices, which can provide years of service from 2 AA alkaline batteries.
- For the US, standard specifies 10 2 MHz-wide 902-928 MHz channels and 16 in the 2400-2483.5 MHz band.
- IEEE 802 group first ratified standard in 2004; 2006 version included enhancements to improve performance in the 902-928 MHz band with 6x higher data rates at the request of OEMs.
- 7 of the top 10 semiconductor companies now manufacture (or plan to) products for this standard; 2007 will see over 10MU sold.
- 902-928 MHz propagation characteristics make it very compelling for outdoor sensors and control devices, as well as improved robustness and reduced interference for indoor environments.
- Current single-chip radio costs are below $1 in volume.

ZigBee Home Automation

- A typical house has nearly 300 opportunities documented
- Security monitoring (46 devices)
- Health/safety monitoring (42)
- Energy, lighting and HVAC control (131)
- Yard and garden (51)
- General convenience functions (21)
- Assuming 10% adoption and 10% of the potential opportunities addressed, over 300M devices in the next 5-7 years

ZigBee Commercial Spaces

- Sensor net application for the detection of dangerous substances (gases, radioactivity, explosives) applicable to Homeland Security uses
- Energy usage management including HVAC, lighting
- Facility activity, usage monitoring, environmental quality
- Occupant safety and building security

- Asset management, monitoring and tracking
- General sensor/control functions
- Wireless devices replace wired devices eliminating industry-estimated wiring costs of $25-$300 per foot
- Allows building managers to rapidly add or modify functionality to suit occupants' needs
- Independent analyst forecasts averaging over 150MU per year in 2010 and upwards of 500MU – 1BU/y in 2012-2014